No. 126, Original

In The Supreme Court of the United States

DEPOSITION OF NORMAN L. KLOCKE, Ph.D., P.E.

STATE OF KANSAS,

Plaintiff,

vs.

STATE OF NEBRASKA and STATE OF COLORADO,

Defendants.

Wednesday, June 27, 2012

8:09 a.m.

PURSUANT TO NOTICE and the Federal Rules of Civil Procedure, the above-entitled deposition was taken on behalf of Defendants at 1525 Sherman Street, Denver, Colorado, before Denise A. Freeman, Registered Professional Reporter and Notary Public within Colorado.

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1 I N D E X

(Exhibits attached to original and electronic transcripts to counsel ordering same.)

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1 P R O C E E D I N G S

2 NORMAN L. KLOCKE, Ph.D., P.E.,

3 having been first duly sworn, was examined and

4 testified as follows:

5 EXAMINATION

6 BY MR. BLANKENAU:

7 Q. Good morning, Dr. Klocke.

8 A. Good morning.

9 Q. Let's begin by having you state your full

10 name and spell your last name, please.

11 A. Norman Lee Klocke, K-L-O-C-K-E.

12 Q. Thank you. Dr. Klocke, I am going to hand

13 you what we are going to mark as Exhibit No. 1.

14 (Deposition Exhibit 1 was marked.)

15 Q. (BY MR. BLANKENAU) Dr. Klocke, do you

16 recognize that document?

17 A. Yes, I do.

18 Q. What is it, please?

19 A. It's the notice for me to appear for this

20 deposition.

21 Q. Does it include a subpoena duces tecum? It

should state it on the very front.

A. Yes.

Q. That requires you to bring any additional documents or data. Did you bring any such materials

with you today?

A. No.

Q. Thank you. Dr. Klocke, when were you first hired by Kansas to serve as an expert witness in this matter?

A. Let's see. It would have been, I believe, December of -- probably actually hired January of 2011.

Q. January 2011?

A. '11.

Q. When did you receive a copy of Dr. Sunding's expert report in this matter?

A. I don't remember the date. It was through electronic transfer, but I certainly don't remember the date. It was before -- of course, before his deposition. I don't remember how long before his deposition.

Q. Do you remember who you received that report from?

A. No, I don't. It was through an e-mail, but I don't know specifically -- remember who the sender

was.

Q. Did you receive any instructions with that transmittal?

A. No, I did not.

Q. You didn't participate in the arbitration

leading to this action, did you?

A. I did not participate.

Q. Did Kansas ever provide you -- anyone from Kansas provide you with a copy of Dr. Sunding's expert report in that arbitration proceeding?

A. No.

Q. Did they ever provide you with a copy of his transcript testimony in that arbitration?

A. No.

Q. Were you aware that Dr. Sunding provided testimony in that proceeding?

A. Not until, I believe, at the time of his deposition, somewhere in there.

Q. So no one from Kansas informed you prior to his deposition that he had participated previously?

A. That's correct.

Q. Following his deposition, did you ask for any of his prior materials from the arbitration?

A. No, I did not.

Q. And by "prior materials," I mean his transcript or his expert report.

A. From previous --

Q. From the arbitration, yes.

A. No.

Q. Were you present at Dr. Sunding's

deposition? I can't recall.

A. Yes, I was.

Q. And did you provide any input to the questions that counsel for Kansas asked Dr. Sunding during his deposition?

A. There are a few questions, yes.

Q. And did you hear his entire deposition?

A. Yes, I did.

Q. Did you receive a copy of his deposition transcript?

A. Yes.

Q. And when did you receive that?

A. I don't specifically remember the dates. Of course, it was after the deposition, but I don't remember if it was weeks or a month or -- in that general area, but I don't remember specifically.

Q. Do you recall from whom you might have

18 received it?
19 A. No.
20 Q. Do you recall any instructions accompanying
21 that transcript?
22 A. There were none.
23 Q. When did you begin working on your rebuttal
24 report?
25 A. Well, it was --

1 MR. DRAPER: Do you mean put pen to paper on
2 his report?
3 MR. BLANKENAU: Just beginning work on the
4 report itself.
5 MR. DRAPER: In other words, write out some
6 first draft, that kind of thing?
7 MR. BLANKENAU: Correct.
8 A. Of course, I was taking notes during the
9 deposition and I was -- had notes generated from the
10 report of Dr. Sunding. As far as when I started -- boy,
11 that's -- it was probably not too long after I received
12 the deposition transcript, but the timing I don't
13 recall.
14 Q. (BY MR. BLANKENAU) And you began taking
15 notes at his deposition in anticipation of a rebuttal

report?

A. No. Just the notes -- I took notes as went along for my own use.

Q. What use would that be?

A. Just so I can recall what went on during the deposition. I did not know anything about a rebuttal report at that time.

Q. Let me switch to your report then, if we might. We'll have this marked as Exhibit No. 2.

(Break was taken from 8:15 to 8:18.)

(Deposition Exhibit 2 was marked.)

Q. (BY MR. BLANKENAU) Dr. Klocke, I just have given you what has been marked as Exhibit No. 2. Again, do you recognize that document?

A. Yes, I do.

Q. What is that, please?

A. It's a copy of the rebuttal report that I prepared.

Q. And we will note for the record that it is a two-sided copy. Did anyone assist you in preparing that rebuttal report?

A. The only assistance I got was in the formatting area, just how to format the report.

Q. From whom did you get that assistance?

A. John Draper.
Q. Why don't you turn to the first page.
That's KS1150. Right before No. 1, Dr. Sunding's Qualifications, you have a sentence, "I am responding to Dr. Sunding's report and deposition as an expert." Do you see that?
A. Yes, I do.
Q. Could you take this blue felt pen and just mark a line on the margin what portions of this report responds to Dr. Sunding's deposition that was not a part of his expert report.

A. Was not a part of -- I am marking what is not part of his expert report?
Q. Correct, but was part of his deposition.
MR. DRAPER: That would include any explicit references to the deposition?
MR. BLANKENAU: Certainly.
Q. (BY MR. BLANKENAU) And you can underline it or however, just as long as we don't really interfere with the text.
A. I will do this to the best of my recollection.
Q. Sure. I can't ask you to do it better than

that.

A. And I am not marking what my responses were to the issues at hand?

Q. You are just identifying the issue itself. That's fine.

A. Okay. This is what I recollect.

Q. And I will note for the record that Dr. Klocke has made his designation with blue felt pen by drawing a vertical line in the left-hand margin of the pages; is that correct?

A. Yes.

Q. I am going to hand this report back to you. Thank you. I'd ask you to turn to, again, KS1150 and

Dr. Sunding's Qualifications, that second paragraph. You identify particular scientific areas of study which you believe are important to understanding crop production functions or developing them. Do you see that?

A. Yes, I do. Can I interject?

Q. Sure.

A. The discussion here is not the crop production function. It's the CROPSIM model.

Q. I'm sorry. Thank you for that clarification.

Can you tell me how the study of soil science, which you have listed there, impacts your understanding of the suitability of CROPSIM for developing crop production functions?

A. Soil science is important because the CROPSIM model is what we call a soil water balance model. So that we are trying to look at the inputs or the water going into the soil volume, which is the active root zone in the crop, and the water as an output of that soil volume.

So there are several processes that go on there that relate to the soil itself. The infiltration component, water going into the soil, and the runoff component, water that does not infiltrate the soil, goes

off -- moves from where it impacted the soil surface. And then the drainage or the water that percolates below the root zone of the crop.

So the processes around the soil into, through, and out of it is the core of what is needed for that soil water balance.

Q. How about the study of agronomy? How does that factor into the same?

A. That more relates to the crop itself as far

as the characteristics of how it grows and develops over the course of the season. That's the main relationship. It's more how the crop functions.

Q. How about agricultural meteorology?

A. That more relates to the relationship of the atmospheric conditions, the energy in the atmosphere, to draw water out of the crop. So, actually, the transpiration process. So that the influence of different parameters in the atmosphere around the crop influence about the water that comes out of the crop.

Q. Is that a specialized field of study, agricultural meteorology?

A. It is a branch -- it is a specialized field. Of course, in my training, specifically we examined and worked with the influence of atmosphere on the water transpiring out of the crop, and that's the piece of ag

meteorology that I have dealt with. It's a much larger field than that.

Q. But the piece that you are dealing with really doesn't have any connection to weather or weather patterns, does it?

A. No. It's the conditions of that day that influences. It's not climate, which I would interpret as weather-pattern-related. This is the actual

radiation, humidity, temperatures, and also the wind movement that affects that crop.

Q. So help me understand then the distinction between agricultural meteorology versus just plain meteorology.

A. Well, the only thing I can try to explain is my piece of what that field might entail. I don't know if I can generalize it too much beyond that.

Q. What about irrigation engineering?

A. That's my specific training. And a lot of what we as irrigation engineers do is try to evaluate or put the whole system together of what -- say, the system of getting the water from the ground through the irrigation system to the crop, to the soil, and then what happens to that water.

So some of these other fields are looking at the different pieces of the system, as we have already

talked about. Where a lot of our work in engineering -- the fields of engineering, we're trying to put the whole system together.

Q. What about crop physiology?

A. That relates to more specifically on the processes going on in the plant to transmit things like

nutrients into the plant and how the plant uses those nutrients, how the crop is growing.

But we have to understand the relationships of the soil water, the status of the soil water, how much water is in the soil and how the crop draws that water out and then gets this to the atmosphere.

I am not talking about the details of the process in the plant. More understanding how that conduit of the water goes -- the conduit of the plants that transmit water through it.

Q. How is that different than agronomy then?

A. I would say it's more specialized than dealing with the details of those processes within the plant.

Agronomy, I think, is a broader field that gets more into the management -- does get more into the management of the crops. And just more the aggregate of what's going on with the crop than the specific processes within the crop.

Q. Would it be fair to describe crop physiology as, effectively, a subset of agronomy?

A. Yes. I would say so, yes. Because that's -- the crop physiology courses I have taken are within an agronomy curriculum.

Q. You also list crop interactions with the atmosphere and soils. That sounds a lot like agronomy again or --

A. Well, there's a lot of crossover between the irrigation engineering community and the agronomy community. So, again, we are putting systems together, but we are always interfacing with agronomists to get the irrigation management in sync with the broader crop management.

Q. I reviewed your CV, after I read the list of studies, and I didn't see reflected in your CV any indication you had received training in any of those areas other than the engineering portion?

A. That would be in my academic -- recorded in my classes in college. As far as specific detail or a specific tie -- but I work with and interact with all of those disciplines.

Q. So why don't you include that in your CV?

A. My course --

Q. All of the information that you have listed

here, all of the fields of study?

A. I guess I didn't -- I really didn't think about putting all my transcripts in.

Q. So then how did you know that Dr. Sunding didn't receive any similar training?

A. Well, again, as I reviewed his CV, he responded the same way I did with manuscripts and all that.

Q. So wouldn't it be fair to say you are not qualified either for the same reason, that it's not reflected in your CV?

A. Well, I guess I disagree with that statement.

Q. Why is that?

A. It was also, I think, an interpretation -- or what I saw in the expert report and in the deposition, that was my interpretation of what he was coming across with, anyway.

Q. But that differs directly with your statement that he didn't have the training or expertise in those areas?

A. I guess I still go by -- my impression was that the expertise was not there.

Q. So it was just based on your gut feel?

A. My interpretation of what was presented in

the report, whether it was presented in the -- or presented in the deposition.

Q. So in your view, unless they list all of these qualifications, all of their studies, your interpretation would be that they aren't qualified; is that correct?

A. Yes, I think that's correct. What I would be looking for would be more evidence.

Q. Let's move to Part 2 then, Kansas Use of Crop Production Functions to Calculate Yield Differences. That's also on KS1150. Do you see that?

A. Yes, I do.

Q. In that section you refer to the Cobb-Douglas mathematical function. Can you describe how you used the Cobb-Douglas mathematical function in your report, your rebuttal report?

A. In the rebuttal report or my expert report?

Q. Excuse me. Your expert report.

A. This was basically the crop production function that I used for the yield response of the crop to the input of irrigation. So that trying -- the way we really went at calculating the differences in yield, when you went from one amount of irrigation to another amount of irrigation, along that crop production function.

So the calculation of the yields -- of the yield differences that came about from that change in the irrigation amount, it came from the crop production function.

Q. What caused the development of the Cobb-Douglas?

A. Dr. Martin at the University of Nebraska, Lincoln, was the one that spearheaded that part of the project that I worked on.

And he really started that work in the 1980s to help us formulate crop production functions based on the inputs to that mathematical equation so that we could move beyond the crop production functions or the measurements we can take in the field research where you were taking measurements of irrigation input, different amounts, and recording the yields as a result.

And then trying to go beyond that research field setting and be more able to generalize it to other settings or other locations.

So we can't conduct field research at every location we want to try to develop a crop production function, but we do need to have that tool in our toolbox.

Q. You state in here that the Cobb-Douglas production function was developed in the economics

field; is that correct? You state that in the third-from-the-bottom line.

A. That statement comes from just -- not a detailed look at it, but from looking at a little bit of the history, the history back into the 1800s and into the 1900s of when Cobb and Douglas were active in coming up with that diminishing return phenomenon and would have an input to a system. You have a response -- in this case, input irrigation and yield response.

And then seeing that, as you add more input, the response becomes less. And Dr. Martin, his contribution was to adapt that to the irrigation field or irrigation applications.

So that's -- I didn't go in detail in looking at that background, but I went to try to find out, Well, where did Cobb and Douglas start?

Q. But you stated it's in the field of economics?

A. That's my understanding, that they were -- that Cobb and Douglas were working in that discipline.

Q. Have you had any training in economics?

A. Well, I think the training in economics that I have had is in conjunction with a lot of the engineering curriculum that we go through as engineers. So that you get into feasibility studies or how the

systems might impact from an economic viewpoint. We have that component of our training.

As far as a specific course, I am trying to recall. I can't bring that back.

Q. Let move to Section 3 then, Applications of CROPSIM. In that first full paragraph of that section, you state that you've tested Dr. Martin's C-D crop production function results with your field research data where you measured actual yields from six different amounts of irrigation over five years. Do you see that?

MR. DRAPER: Which paragraph?

MR. BLANKENAU: The first full paragraph of Section 3 on KS1151.

MR. DRAPER: And the particular sentence you are interested in?

A. I see it about midway down.

Q. (BY MR. BLANKENAU) Yeah. Let me just quote it so Counsel can know what I am looking at. It's, quote, I tested Dr. Martin's C-D crop production function results with my field research data where I measured actual yields from six different amounts of irrigation over five years, end quote. Do you see that?

A. Yes, I do.

Q. Where did you conduct that research?

25 A. Garden City, Kansas.

1 Q. Where is that relative to the KBID area?
2 A. This would be in southwest Kansas. Relative
3 in miles, I would say possibly it's -- KBID is northeast
4 of Garden City probably about 200 miles.
5 Q. So how many miles east, approximately?
6 A. I would say, 120 to 140, something in that
7 range.
8 Q. And when did you conduct this research?
9 A. The results I quoted were from 2005 to 2009.
10 We have carried on that experiment beyond 2009.
11 Q. In the Garden City area?
12 A. At the Garden City Research Center.
13 Q. Toward the bottom of that same section, the
14 last paragraph, you state, "Contrary to Dr. Sunding's
15 assertions, the C-D crop production function based on
16 CROPSIM parameters is a method accepted by experts in
17 Nebraska and Kansas for use in decision management tools
18 and by the RMA for yield expectations for changes in
19 water supplies for irrigation." Do you see that?
20 A. Yes.
21 Q. Can you name those experts that you are
22 referring to?
23 A. Okay. I might also interject here. What I

was thinking about here was whether this originated from the deposition or the report. That I can't recall.

Q. Take a few minutes to think about it, if you need to.

A. I believe that the reference to decision management tools, I believe that Dr. Sunding discussed that in his deposition, I believe.

And go back to your question now.

Q. Sure. You indicate that it was an accepted method by experts in Nebraska and Kansas?

A. Okay.

Q. Can you name those experts for me, please?

A. That would be Dr. Derrel Martin. As far as the application of the CROPSIM parameters to the C-D function, that would come from Dr. Martin.

Q. Were there any in Kansas then?

A. Well, myself. And my role was, again, to test the results. So when the results coincided, I thought it was an appropriate application of the C-D function.

Q. And did that same expert, Dr. Martin, use the C-D crop production function to calculate damages in any litigation that you are aware of?

A. Not that I am aware of.

Q. Can you identify any peer-reviewed publications that support the use of C-D crop production functions as you used them in this litigation?

A. There's the 2010 report by Dr. Martin, the paper I used as one of my references, which is on page 9.

Q. That's KS1158?

A. Yes, it is.

Q. I think we can move to Section 4 then. Kind of in the middle of that first paragraph -- and I am back on KS1151 -- it starts with, "I would expect." You indicate that the 30-year average maximum yield from CROPSIM is different than the maximum yields from current years. Do you see that?

A. Yes.

Q. By "different" do you mean lower?

A. Well, it relates to Figure 1 where there has been a generally upward trend in yields over the years. In irrigated yields particularly, not so much in the nonirrigated yields.

So because the CROPSIM was executed over a longer time period, I would expect that it would be somewhere along that regression line. So that yes, the

potential yields that we are seeing in our crops, especially corn, it is increasing over the years.

Q. What causes that increase, do you think?

A. There's, of course, several factors. One would be the genetics of the crop being improved,

particularly where management practices are getting more honed and the irrigation practices that we are using are more efficient in delivering water to the crop and the crop's use of the water.

So there are agronomic factors that -- a better capability of the crop to produce yields and also the management factors, including irrigation.

Q. If CROPSIM maximum yields are lower than actual current year maximum yields, how does that impact the range of error of your model?

A. As far as -- what we did was calculating yield differences, and that's what we are doing here in this case. The maximum yield actually drops out of the equation. So that we are -- the things that influence the production function for the Cobb-Douglas is what Dr. Martin calls water use efficiency.

And then also the slope of the yield response to evapotranspiration. Evapotranspiration,

meaning the consumptive use of water by the crop and evaporation from the soil surface.

MR. BLANKENAU: I am getting thirsty. Would it be appropriate for a 10-minute break?

MR. DRAPER: Okay.

(Break was taken from 8:49 to 9:14.)

Q. (BY MR. BLANKENAU) Dr. Klocke, let's move to

Section 5 of your report, which begins at KS1152. Do you have that?

A. Yes.

Q. There's a sentence that I found curious. It's the last sentence on that page. It states, "There was no statistical correlation between annual precipitation and irrigated or nonirrigated crop yields." Do you see that?

A. Yes.

Q. Is that statement a general proposition or did you actually make a study on that point?

A. Let's go to Figure 2. And I was relating that to the R-square values.

Q. So that would be your study of that principle that you are espousing there; is that correct?

A. Yes. It was based on the regressions I did on the data.

Q. Why didn't you include that information in your initial report?

A. In my initial report?

Q. Yes.

A. Again, Dr. Martin and myself, through the work we did with the Risk Management Agency, were looking at average conditions for applying the Cobb-Douglas function. So the precipitation on the

particular -- the precipitation, per se, was -- and its variability was a part of, embedded in, the CROPSIM model. It developed the parameters.

So as we applied it, we are applying it in the average conditions of the 30-year -- 30-year coverage of the CROPSIM model. So it really wasn't pertinent -- the numbers of the precipitation weren't pertinent to how we applied the C-D crop production function.

The location was pertinent because the inputs to the crops -- or the inputs to the CROPSIM model were localized by county, as I pointed out.

Q. I guess I still don't understand why you wouldn't have included that in your original report.

A. Well, I just didn't.

Q. Let me draw your attention then to Figure 2. Were those regression coefficients statistically significant?

A. How I interpret the regression coefficients would be R-square. That's not the coefficients of the equation, but the R-square, and I considered that there was no correlation. That was my interpretation of the R-square number because it's very, very small.

Q. So if I understand your position, it's the location and timing of rainfall that is important to

consider relative to crop yields; is that correct?

A. That's part of it. Because your effective precipitation is actually -- the water that the crop can use from precipitation is a component also in the CROPSIM model.

So it's not only the timing of the -- one of the components of that yield relationship to precipitation is the timing of the precipitation and the irrigation events and how effective that water is utilized as part of that component. And also the intensity of the rainfall event itself, the condition of the surface of the soil as far as infiltration, its capability to take water in.

There's several factors influencing the

15 nonresponse of yield-related annual precipitation as
16 represented here.
17 Q. You mentioned "effective precipitation."
18 What would be noneffective precipitation?
19 A. Again, it would be -- the water that is not
20 captured by the soil, it runs off, does not stay where
21 the initial impact of that rainfall in getting into the
22 soil. So that's the primary factor. And, of course, a
23 lot of factors influence how much runoff there is.
24 The wetness of the soil; what happened
25 before the precipitation event; how the precipitation

1 event came -- in other words, intensity; whether it was
2 a short duration storm or a longer duration storm; the
3 coverage of the soil with crop residue, for example; the
4 slope of the soil surface, the land surface.
5 So there are quite variable conditions as
6 far as water from precipitation impacting the crop. You
7 can also think about the precipitation that occurs --
8 does not occur during the growing season and its
9 relationship from the time of the precipitation to the
10 time of the extraction of the water from the soil.
11 And the effectiveness of that precipitation
12 with a nongrowing season is also embedded here because

of the -- we are treating the annual precipitation.

Q. Is runoff the only noneffective precip component?

A. Another component, as I was talking about, is the timing of the irrigation -- or the precipitation in relationship to when the water is used by the crop. So if you have a precipitation event in the fall preceding the growing season -- the preceding fall, then that is not as effective because it's -- it's way ahead of the use of the water.

Also precipitation that percolates through the soil and is not picked up by the crop isn't effective. So it's what doesn't go into the soil,

runoff, and what isn't used by the crop. It drains through. And these phenomenon work year-round as far as water in the soil and then having it actually used by the crop.

Q. Can deep percolation leach fertilizer and other nutrients beyond the root zone?

A. Yes.

Q. What does that do to crop production?

A. Well, as far as crop production, if there's ample nutrients in the soil that are not carried through leaching, then the crop doesn't suffer because of that

lack -- any lack of nutrients. Now if the leaching comes about and takes enough -- percolates and takes enough nutrients away from the crop, it could influence the potential production of the crop.

But, again, there are nutrients from the fertilizer that we apply and there are nutrients from the soil itself that are there. So you can't always relate the fertilizer amounts directly to the crop yield. So as far as fertilizer goes, it's, again, a diminishing return response to an input.

Q. So would it be overly simplistic then to just look at, say, the average annual precipitation over the Lower Republican Basin to draw any conclusions about crop yields?

A. That's not what I am trying to illustrate here. That over the long term, we're looking at the -- I don't remember how many years; 35 years -- of data, and that's represented. And then the low R-squared, there's not a relationship.

Q. So if I did say, It rained X amount last year in the lower Republican; ergo, I must have certain crop yields, that would be taking the proposition too far; is that correct?

A. I think it's probably, again, as you say, an oversimplification. I would say, it is an oversimplification.

Q. How do you explain the high yields of KBID in 2005?

A. I am trying to look for where this is in my report. Can you frame that question again, please?

Q. Sure. How do you explain the high crop yields of KBID in 2005?

A. I can't really say whether they were high.

Q. You haven't reviewed the yield of KBID in those years?

A. Yes, I have. But I am talking about what's the potential yield during those years.

Q. But it was a record year on some of those acres. That isn't your definition of a high yield?

A. For instance, in crop performance testing that Kansas State University does in that area, the yields there were well over 200 bushels an acre. So I think we are looking at potential yields, and we are getting, routinely, over 200 bushels of corn on producers' fields.

Q. So if I understand you correctly, it not only has to be a record yield, but it has to be the

absolute maximum yield to be a high yield?

A. I think we are getting down to -- again, the characterization of yield in the C-D crop production function, when we calculate yield differences, the maximum yield drops out of the equation.

So when we are calculating yield differences, it's more important to define the water use efficiency than the yield versus ET, which Dr. Martin had those parameters in the C-D equation.

So I didn't characterize -- try to characterize the relationship that yield would be the maximum yield or try to put a definition to that yield that was measured by KBID.

Q. Let me take you to page 5 of your report, KS1154, where you provide a couple of examples of the day-to-day variability of precipitation. Do you see that? It's in the second paragraph about halfway

through. And you give an example from 2005 and an example from 2006. Do you see that?

A. Yes. It's actually 2004 -- after harvest 2004 through harvest 2005. So it's not a calendar year.

Q. I am not sure we are on the same page. Are you on KS1154?

A. Yes, I am. The second paragraph, you said?
Q. Yeah. And I am looking toward the very end. You have, "For example, in July 2005"?
A. Yes.
Q. You refer to a specific storm in 2005?
A. Yes. And this was shown in --
MR. DRAPER: What was your question?
MR. BLANKENAU: I am just trying to orient him to the sentence. We seem to have had a disconnect there.
MR. DRAPER: Did you find that sentence?
A. Let's go back here. "For example" is where that sentence starts?
Q. (BY MR. BLANKENAU) Yeah. And I have a couple questions for you on your example.
A. Okay.
Q. Can you tell me what the percolation rate of the soils in KBID was at that time?
A. Specifically for that storm?

Q. Yes.
A. No.
Q. Do you know what the rainfall rate was for that particular storm?
A. The intensity?

Q. Yes.

A. Only on a daily basis. So if you look at -- storm event 1 that I referred to is October 2004 through September 2005. It would be -- I can only characterize it as two and a half inches in that 24-hour period.

Q. So you don't know the actual intensity of that rainfall?

A. The intensity, of course. There would be a -- usually the intensity starts low and it goes high, depending on the storm characteristics. Or you might have a thunderstorm that gives you high intensity and it tails off. And I can't characterize that.

Q. Do you know what the soil water balance was prior to that rainfall event?

A. No, I don't. Again, you would have to define it. If you are trying to pin it down to a specific field, I would look at more that we had a rainfall event recorded. But across the surrounding fields of that event, there would be quite a bit of variability, from my perspective, in the soil water at

that particular time.

So I can't characterize it for a specific location because there's so much variability, as I have

been trying to point out. So there would be all -- a whole range of soil water content if you look across different fields.

Q. Is an infiltration rate of .104 inches per hour very high for that KBID region?

A. Again, I would have to go back to the soils characteristics themselves. I can't -- picking out a number there, I really can't react to that based on what you told me.

Q. And you didn't go through and check any of that -- any of those factors relative to your two examples?

A. Relative to those specific events?

Q. Yes.

A. No. But it really would be impossible to do that. Let's back up. What parameters are you talking about?

Q. Those that you just -- that we just discussed -- what the percolation rate was of the soil, what the soil water balance was, what the rainfall rate was or rainfall intensity -- all of that information relative to the two examples that you provided.

A. I did not investigate that.

Q. Throughout your report you have referenced

the work of Dr. Derrel Martin. You have a high regard for his work?

A. Yes, I do.

Q. If Dr. Martin were to be critical of how you applied your work in this report, would you agree that your report would be deficient?

A. I would have to know a lot more about what his position was.

Q. Let's go to Section 7 of your report. You have Tables 2 and 3. Can you explain those two tables to me?

A. These are annual -- the reported yields by NASS who reported for those cropping years. And the Irrigated is irrigated bushels per acre for the -- let me back up just a little bit.

The first two rows are reported by the NASS data for those two years.

Q. Okay.

A. The CROPSIM row, those are the parameters that went into the -- if you were calculating the yield directly. I've reported on those in my expert testimony, and these came from the simulations that Dr. Martin conducted.

So we are looking at then the nonirrigated yields in the same respect. The first two rows were reported by the NASS and the third row came from the crop simulations that Dr. Martin produced. The calculation that I made was the difference column by subtracting the nonirrigated from the irrigated.

Q. And it looks like you have got the 2005 and 2006 but only a single crop simulation?

A. That's correct.

Q. So it would be the same for both of those two years then?

A. We would use the Cobb-Douglas equation -- or crop production function the same for two years. That's how we did it. But I was trying to point out here the fact that especially -- well, the prime point on here is that the dry land or nonirrigated yields were consistent with CROPSIM in 2005 as reported by NASS. And in 2006 they were lower.

But there was a correlation or a similarity between the differences -- irrigated and nonirrigated crop yields in 2005 and CROPSIM results.

Q. And this is with respect to north central Kansas, correct?

A. That's correct.

Q. And what area of Kansas does that typically

encompass?

A. I can't give you the counties specifically, but the state's divided into three parts east to west and then two parts north to south. So there are essentially six geographic areas that are blocked east and west and north and south.

Q. So it's not specific to KBID then, these tables?

A. Correct. It's more generalized than KBID.

Q. For 2006 did you review the CROPSIM output to determine the causes of reduced dryland yields?

A. Again, the CROPSIM was actually created over this 30-year period, so all of the different variabilities in what we have been talking about as far as precipitation and the other processes were not specific to each year. It was two years as Dr. Martin executed CROPSIM.

Q. Can you tell me what the input values were for your 2005 crop simulation?

A. Again, that was not -- the CROPSIM was not executed for a particular year, 2005. It's a cumulation of years.

Q. What group of years would it have encompassed, if you know?

A. I don't know specifically.

Q. What particular values would it include, though, for any given group of years?

A. Parameters?

Q. Parameters.

A. In CROPSIM?

Q. Yes.

A. It would be easiest to look at Dr. Martin's report and look at all the processes that he reported on or gave examples of in his report. So I would point to that report.

Q. When you ran CROPSIM for these tables -- and you personally ran CROPSIM?

A. No, I did not run this with CROPSIM. Again, the results from those models -- that modeling was the execution of CROPSIM that Dr. Martin conducted.

Q. So you didn't do any independent analysis using CROPSIM for this report?

A. The only independent analysis I did was comparing my five years of data at Garden City with the parameters that Dr. Martin developed in CROPSIM for our location of Garden City.

Q. Do you recall what volume of water CROPSIM determined was lacking?

A. Lacking when?

25 Q. For 2005.

1 A. Again, it did not -- it was not executed
2 that way.
3 Q. Within that group of years?
4 A. 2005 to 2006?
5 Q. Yeah.
6 A. I don't know. I don't know the answer to
7 that question.
8 Q. So using this tool, you wouldn't be able to
9 tell us what volume of water would have been necessary
10 to achieve the optimal production?
11 A. I couldn't tell you personally.
12 Q. You validated Dr. Martin's work for Garden
13 City. Did you do that for the KBID area?
14 A. I didn't have the input data to do that.
15 Because, again, in my field side, I could put on six
16 different amounts of irrigation and get the yield
17 response, so I can describe that crop production
18 function based on those -- 2005 to 2009.
19 So that's the fundamental reason why I
20 wanted to develop a crop production function for other
21 locations, so that we could extend what we know from
22 field research to other locations.
23 Q. Doctor, do you recall when you completed

your rebuttal report, what day?

A. The date on here shows June 5, 2012.

Q. And that would have been the day that you completed it?

A. No. I can't recall if that was the date it was submitted or whether -- the exact date.

Q. Would it have been modified in any way after you submitted it?

A. After I submitted it on June 5?

Q. Yes.

A. No.

Q. And to whom did you submit your report?

A. John Draper.

(Deposition Exhibit 3 was marked.)

Q. (BY MR. BLANKENAU) Doctor, I am going to show you what will be marked as Exhibit 3. Does that look familiar to you?

A. No. I can't read the table here.

Q. Would that be the precip near KBID from Courtland data?

A. I don't know.

Q. Can you tell me who Sam Perkins is?

A. He is with the Kansas Department of

Agriculture.

Q. Did he work on this -- on your rebuttal report at all?

A. No. He supplied the data. He supplied the

data.

Q. Did you work with Chris Grunewald at all?

A. No.

Q. Do you have any reason to believe that he may have modified your report in any way?

A. Well, again, there was a -- I had to -- no, I don't have any reason to believe he did.

Q. But you submitted your report to Mr. Draper and you believe that was the end of it then?

A. Pardon me?

Q. You submitted your report to Mr. Draper and you believed that was the end of it?

A. Yes.

MR. BLANKENAU: I think we are done, but why don't you give us just a couple of quick minutes, if that's all right.

(Break was taken from 9:45 to 9:49.)

MR. BLANKENAU: That concludes the deposition. Thank you, Dr. Klocke.

MR. DRAPER: No questions from us.

(WHEREUPON, the deposition concluded at 9:49 a.m.)

I, NORMAN L. KLOCKE, Ph.D., P.E., do hereby certify that I have read the foregoing transcript and that the same and accompanying correction sheets, if any, constitute a true and complete record of my testimony.

_____
Deponent

( ) No changes ( ) Amendments attached

Subscribed and sworn to before me this _____ day of _____, 2012.

My commission expires _____.

_____
Notary Public

Address _____

_____

df
State of Kansas vs. State of Nebraska and State of Colorado

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REPORTER'S CERTIFICATE

STATE OF COLORADO)
) SS.
COUNTY OF DENVER)

I, Denise A. Freeman, do hereby certify that I am a Registered Professional Reporter and Notary Public within the state of Colorado; that previous to the commencement of the examination, the deponent was duly sworn by me to testify to the truth.

I further certify that this deposition was taken in shorthand by me at the time and place herein set forth and was thereafter reduced to typewritten form, and that the foregoing constitutes a true and correct transcript.

I further certify that I am not related to, employed by, nor of counsel for any of the parties or attorneys herein, nor otherwise interested in the

result of the within action.

I further certify reading and signing not requested pursuant to CRCP Rule 30(e).

In witness whereof, I have affixed my signature this 29th day of June, 2012.

PATTERSON REPORTING & VIDEO
Denise A. Freeman
Registered Professional Reporter
and Notary Public

PATTERSON REPORTING & VIDEO
2170 South Parker Road, Suite 263
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June 29, 2012

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Case Name: State of Kansas vs. State of Nebraska and State of Colorado
No. 126, Original
Deposition of NORMAN L. KLOCKE, Ph.D., P.E.

The deposition in the above-entitled matter is ready for reading and signing. Please attend to this matter by complying with ALL blanks checked below:

_X__ arrange with us at (303)696-7680 to read and sign the deposition in our office

OR (if applicable),

_X__ have deponent read your copy; signing attached original signature page and any amendment sheets.

____ read enclosed deposition, sign attached
signature page and any amendment sheets.

_X__ within 35 days of the date of this letter.

____ by _____ due to a trial date of _____.

Please be sure that the signature page and accompanying amendment sheets, if any, are signed before a notary public and returned to our office at the above address.

If this matter has not been taken care of within said period of time, the deposition will be filed unsigned pursuant to the Rules of Civil Procedure.

Thank you.

Enclosures: (As above noted)
cc: Donald G. Blankenau, Esq.; Scott Steinbrecher, Esq.

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2170 South Parker Road, Suite 263
Denver, Colorado 80231

June 29, 2012

DONALD G. BLANKENAU, ESQ.
Special Assistant Attorneys General
Blankenau Wilmoth, LLP
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Dear Mr. Blankenau:

Re: Deposition of NORMAN L. KLOCKE, Ph.D., P.E.

____ Signed, no changes.

____ Signed, with changes, copy attached.

____ No signature required.

__X_ Reading and signing not requested pursuant to CRCP Rule 30(e).

____ Signature waived.

__X_ Forwarding original transcript unsigned;
signature pages and/or amendments will be
forwarded, if received.

____ Original exhibits included in ongoing notebook
and will be filed with counsel at conclusion of
discovery.

____ Via Email.

Enclosures: (As above noted)
cc: John B. Draper, Esq.; Scott Steinbrecher, Esq.

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